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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/540,540	09/11/2006	Norio Hirayama	046124-5385	7158

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MORGAN LEWIS & BOCKIUS LLP
1111 PENNSYLVANIA AVENUE NW
WASHINGTON, DC 20004

EXAMINER	
FEELY, MICHAEL J	
ART UNIT	PAPER NUMBER
1761	
MAIL DATE	DELIVERY MODE
02/25/2011	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/540,540	HIRAYAMA ET AL.	
	Examiner	Art Unit	
	Michael J. Feely	1761	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 November 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5 and 17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5 and 17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 June 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Pending Claims

Claims 1-5 and 17 are pending.

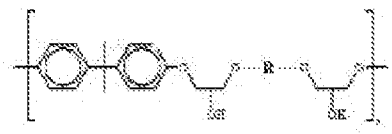
Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on November 16, 2010 has been entered.

Election/Restrictions

2. Applicant's election of species (Type 1a) in the reply filed on February 25, 2010 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)). The elected species is drawn to the following method:

- (Type 1a) the method as claimed featuring a poly-addition polymerization reaction between a bi-functional compound having two epoxy groups and a bi-functional **phenolic** compound having two **hydroxy** groups, yielding a thermoplastic with the following repeat unit:



Response to Amendment

3. The rejection of claims 1-3 and 17 under 35 U.S.C. 102(b) as being anticipated by Brennan et al. (US Pat. No. 6,011,111) has been overcome by amendment.

4. The rejection of claims 4 and 5 under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Brennan et al. (US Pat. No. 6,011,111) has been overcome by amendment.

Claim Rejections - 35 USC § 103

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claims 1-5 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brennan et al. (US Pat. No. 6,011,111) in view of Berman et al. (US Pat. No. 4,756,954).

Regarding claims 1-3 and 17, Brennan et al. disclose: **(1)** a method of manufacturing a fiber-reinforced thermoplastic (Abstract), comprising:

(a) a mixing step for mixing an uncured thermosetting resin with reinforcing fibers to obtain a mixture (column 1, lines 48-52; column 8, lines 8-26); and

(b) a reaction step for forming a thermoplastic by causing a polymerization reaction of the thermosetting resin in the mixture so that the thermosetting resin polymerizes,

wherein said uncured thermosetting resin comprises a first reactive compound and a second reactive compound (column 1, lines 48-52; column 8, lines 8-26), and said polymerization reaction is a polyaddition reaction between said first reactive compound and said second reactive compound (column 5, line 59 through column 6, line 3),

wherein said first reactive compound is a bifunctional compound having two epoxy groups (column 6, lines 4-21), and said second reactive compound is a bifunctional compound having two phenolic hydroxyl groups (column 6, lines 22-64);

(2) wherein said reinforcing fibers constitute a reinforcing fiber knitted web (column 1, line 62 through column 2, line 38, particularly column 2, line 10);

(3) wherein said reinforcing fibers are glass fibers (column 1, line 62 through column 2, line 38, particularly column 2, lines 30-35); and

(17) a fiber-reinforced thermoplastics, manufactured according to the method described in any of claim 1 (Abstract; column 1, lines 45-52; column 8, lines 8-26).

Brennan et al. disclose that the reaction between the first reactive compound and the second reactive compound is performed "under conditions sufficient to cause the hydroxyl moieties to react with the epoxy moieties to form ether linkages," yielding a phenoxy resin (see column 5, lines 59-65). However, they fail to explicitly disclose: **(1)** wherein a polymerization catalyst selected from the group consisting of: phosphorus catalyst, 1,2-alkylenebenzimidazole, 2-aryl-4,5-diphenylimidazole, and combinations thereof, is used in said polyaddition.

The teachings of Berman et al. demonstrate that the presence of a catalyst (see: column 2, lines 19-26) is recognized in the art as a condition sufficient to cause this reaction in the formation of phenoxy resins (see: column 2, lines 19-26; column 2, line 36 through 4, line 38) and advanced epoxy resins (see: column 2, lines 27-35; column 4, line 39 through column 5, line 8). Berman et al. disclose that suitable catalysts include phosphonium compounds, imidazoles, and phoshines (see: column 5, lines 9-20). This teaching demonstrates that the instantly claimed phosphorus catalyst is recognized in the art as a suitable catalyst for this reaction. In light of

this, it has been found that the selection of a known material based on its suitability for its intended use supports a prima facie obviousness determination – see MPEP 2144.07. Furthermore, the teaching suggests that the instantly claimed imidazole-type catalysts are recognized in the art as suitable catalysts for this reaction.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the instantly claimed catalyst in the method of Brennan et al. because: (a) Brennan et al. disclose that the reaction between the first reactive compound and the second reactive compound is performed "under conditions sufficient to cause the hydroxyl moieties to react with the epoxy moieties to form ether linkages," yielding a phenoxy resin; (b) the teachings of Berman et al. demonstrate that the presence of a catalyst is recognized in the art as a condition sufficient to cause this reaction in the formation of phenoxy resins and advanced epoxy resins; (c) the teachings of Berman et al. demonstrate that the instantly claimed phosphorus catalyst is recognized in the art as a suitable catalyst for this reaction; and (d) it has been found that the selection of a known material based on its suitability for its intended use supports a prima facie obviousness determination. Furthermore, the teachings of Berman et al. suggest that the instantly claimed imidazole-type catalysts are recognized in the art as suitable catalysts for this reaction.

Regarding claims 4 and 5, the combined teachings of Brennan et al. and Berman et al. are as set forth above and incorporated herein. The combined teachings obviously satisfy all of the instantly claimed process limitations, including the material/chemical limitations of the starting materials and final product. However, the combined teachings fail to explicitly disclose the following properties of the final product:

- **(4)** wherein, in the thermoplastics obtained in the reaction step, the softening point at which the storage modulus (Pa) is 1/10 of the storage modulus (Pa) at 300 K is between 310-450K, and at a temperature equal to or above the softening point, the storage modulus (Pa) is 1/100 of the storage modulus (Pa) at 300 K or less; and
- **(5)** wherein, in the thermoplastics obtained in the reaction step, the value of (E1-E2)/(T2-T1) when the storage moduli (Pa) at temperatures (K) T1 and T2 (T1<T2) below 450K are respectively E1 and E2, is $1 \times 10^5 - 1 \times 10^{10}$ (Pa/K).

The skilled artisan would have expected the final product produced by the combined teachings to satisfy these property limitations because the combined teachings satisfy all of the instantly claimed process limitations, including the material/chemical limitations of the starting materials and final product. It has been found that, "Products of identical chemical composition can not have mutually exclusive properties." A chemical composition and its properties are inseparable. Therefore, if the prior art teaches the identical chemical structure, the properties applicant discloses and/or claims are necessarily present – In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

Therefore, the skilled artisan would have expected the final product produced by the combined teachings of Brennan et al. and Berman et al. to satisfy the instantly claimed property limitations because the combined teachings satisfy all of the instantly claimed process limitations, including the material/chemical limitations of the starting materials and final product.

Communication

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J. Feely whose telephone number is (571)272-1086. The examiner can normally be reached on M-F 8:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Y. Pyon can be reached on 571-272-1498. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael J Feely/
Primary Examiner, Art Unit 1761

February 24, 2011